



Skype for Business

Skype for Business GEO-EDGE

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Introduction



Work with



SfB Unit Leader



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MVP since 2012

Topics

- Simple URL deployment
- MEET and DIALIN principals
- Understanding SIP Access Edge Flow
- Understanding Web Conferencing Flow
- Principals on STUN and TURN
(thanks to Jeff Schertz Polycom for his support)
- Understanding A/V Edge Flow
- Advice for Geo Edge Deployments

- Principals for CCE Deployments

GEO DNS and Geo native deployment

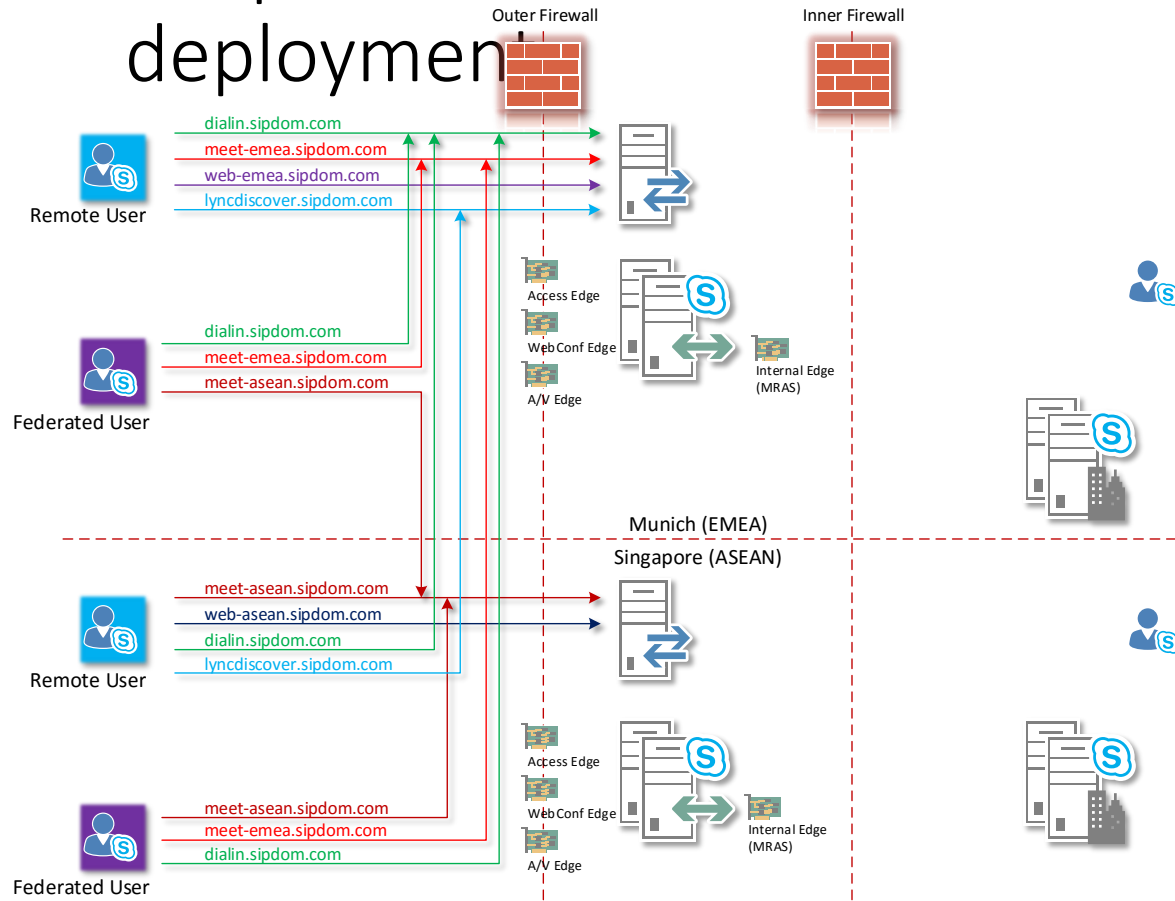
GEO DNS

- would answer DNS queries based on the client source IP address
- Allows flex deployment for all DNS name, NOT for AV Edge
- Requires external GEO DNS provide

Native DNS planning's

- Native GEO deployment required DNS location based planning's
- Static location oriented DNS resolution
- No additional service needed

Simple URL deployment



- DIALIN URL – unique global URL (very suitable for ext. GEO DNS)
- LYNCDISCOVER – unique global URL (very suitable for ext. GEO DNS)
- MEET URL – global or localized URL
- EXWEB URL – Pool/ Regional URL

MEET and DIALIN principals

Meeting URL can be customized based on Skype Site

```
$urlEntry = New-CsSimpleUrlEntry -Url https://meet-de.sipdom.com  
$simpleUrl = New-CsSimpleUrl -Component "meet" -Domain  
"sipdom.com" -SimpleUrlEntry $urlEntry -ActiveUrl https://meet-de.sipdom.com  
Set-CsSimpleUrlConfiguration -Identity "site:Germany" -SimpleUrl  
{Add=$simpleUrl}
```

DIALIN URL must be part of the GLOBAL Skype Topology

- Multiple DIALIN URLs are not supported

SIP Access Edge Flow

This GeoDNS would apply for internal and external services in the form of:

GeoDNS record (example)	Pool records (example)	CNAME records (example)	DNS settings (select one option)
Meet-int.geolb.sipdom.com	Pool1InternalWebFQDN.sipdom.com Pool2InternalWebFQDN.sipdom.com	Meet.sipdom.com alias to Pool1InternalWebFQDN.sipdom.com Meet.sipdom.com alias to Pool2InternalWebFQDN.sipdom.com	Round Robin between pools Use primary, connect to secondary if failure
Meet-ext.geolb.sipdom.com	Pool1ExternalWebFQDN.sipdom.com Pool2ExternalWebFQDN.sipdom.com	Meet.sipdom.com alias to Pool1ExternalWebFQDN.sipdom.com Meet.sipdom.com alias to Pool2ExternalWebFQDN.sipdom.com	Round Robin between pools Use primary, connect to secondary if failure

SIP.sipdom.com is targeted as DNS A record, therefore is can only deliver a SINGLE IP Address (or multiple IP Addresses for single DNS LB Edge Pool).

This don't let differentiate and point to regional Edge Pools!

Single entry point to e.g. Federation

For a **client logon failover scenario** we MUST make use of weighted SRV records, since we are not using GeoDNS.

```
_SIP._TLS.SIPDOM.COM 0 100 5061 EDGE-POOL-DE.SIPDOM.COM  
_SIP._TLS.SIPDOM.COM 0 200 5061 EDGE-POOL-SG.SIPDOM.COM  
_SIP._TLS.SIPDOM.COM 0 300 5061 EDGE-POOL-CA.SIPDOM.COM
```

Web Conferencing Flow

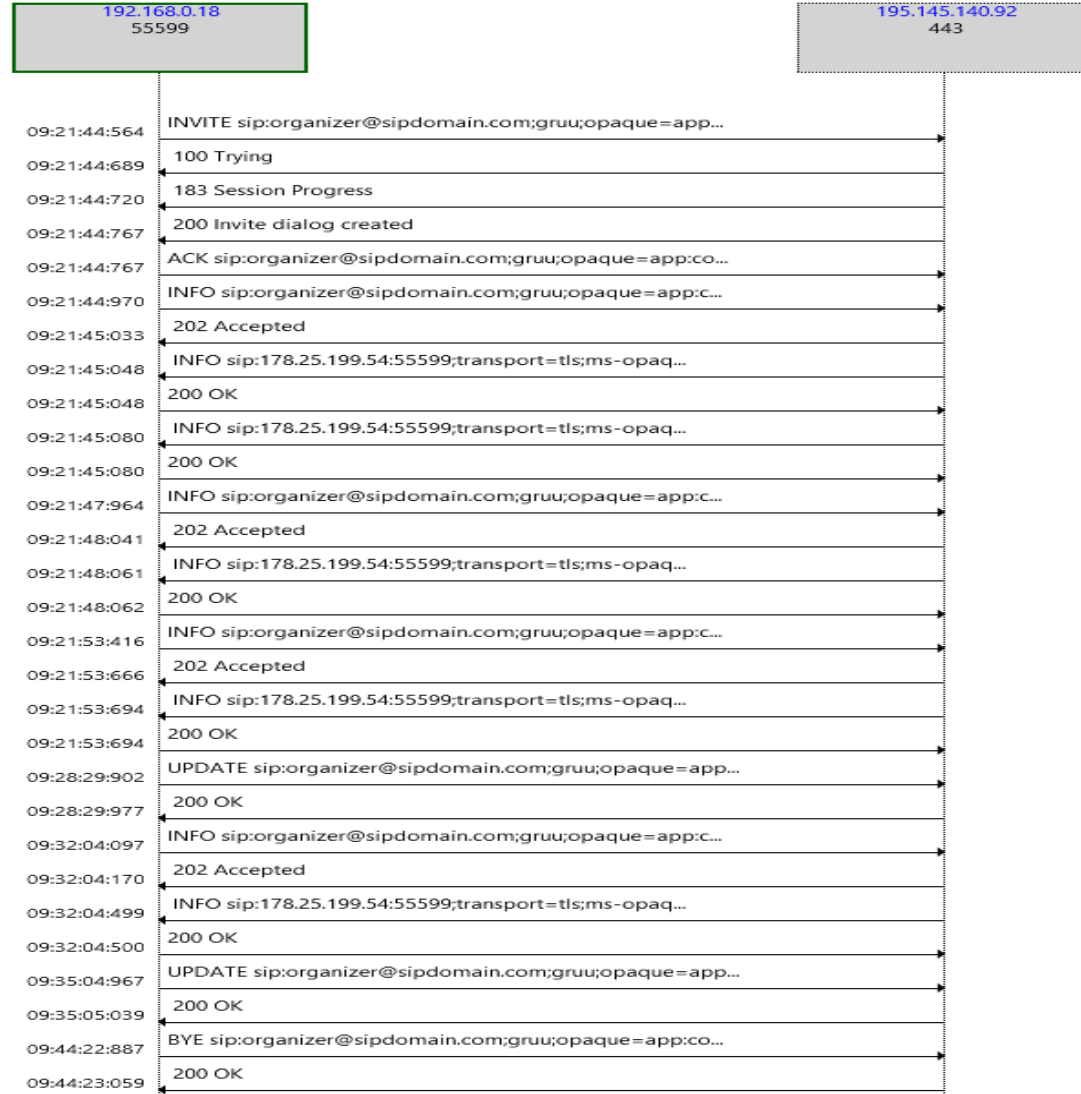
Activate e.g. White Board

What we identify if we run the ipconfig /displaydns command is:

webconf.participant.com

```
-----  
Record Name . . . . . : webconf.participant.com  
Record Type . . . . . : 1  
Time To Live . . . . . : 86003  
Data Length . . . . . : 4  
Section . . . . . : Answer  
A (Host) Record . . . : 195.145.140.90
```

The INVITE introducing the CCCP web Conferencing Protocol and the SPECIALSIP message INFO with the **proxy[0].FQDN** where the associated Web Conferencing Edge FQDN is submitted.



Web Conferencing Flow

INFO sip:178.25.199.54:55599;transport=tl;ms-opaque=0183d7bf32;ms-received-cid=10D0400;grid SIP/2.0
ms-user-logout-data: RemoteUser
Via: SIP/2.0/TLS 10.90.0.2:443;branch=z9hG4bKEAF3233D.2FBACEB2D1BA9781;branched=FALSE;ms-internal-info="dwS6aw8wD4GPdqiyfT1hDcuDW1DxwTOP-YWvnObIFnMKSyzrovJ1B9VwAA"
Via: SIP/2.0/TLS 10.35.3.27:51966;branch=z9hG4bK4E70787E.486944BED6A5D784;branched=FALSE;ms-received-port=51966;ms-received-cid=10CCF00
Via: SIP/2.0/TLS 10.35.3.30:64925;branch=z9hG4bK17E73F62.7E008B7DD1BA9781;branched=FALSE;ms-received-port=64925;ms-received-cid=17E1900
Via: SIP/2.0/TLS 62.75.183.54:52979;branch=z9hG4bKCA90E804.556B330F34BC5780;branched=FALSE;ms-internal-info="afkix_jPg9eKrv0dAeAfD9eWAbW2h2KPdnLFSAh056rkPM2tVTHia7AAA";ms-received-port=52979;ms-received-cid=10E8400
Via: SIP/2.0/TLS 192.168.45.5:52367;branch=z9hG4bK15A5C863.3E1ECDE0E4F3E784;branched=FALSE;ms-received-port=52367;ms-received-cid=1ACB00
Max-Forwards: 66
Authentication-Info: TLS-DSK qop="auth", opaque="E0AD425F", srand="B9CB62F8", snum="2907", rspauth="a5cc59202fce52f13ec1ab1679e6c6e669ebdea2", targetname="xsrlync7.participant.local", realm="SIP Communications Service", version=4
Content-Length: 6245
From: <sip:organizer@sipdom.com;gruu;opaque=app:conf:focus:id:N9SPWGZR>;tag=74340080
To: <sip:thomas.poett@participant.com>;tag=0cc9ad836a;epid=545cc1d9ca
Call-ID: 2a414ec63e1542f193450dcb7751606a
CSeq: 11 INFO
Supported: ms-dialog-route-set-update
Content-Type: application/cccp+xml
ms-edge-proxy-message-trust: ms-source-type=DirectPartner;ms-ep-fqdn=lynxedsgepool.participant.local;ms-source-network=federation;ms-source-verified-user=verified

```
- <response xmlns="urn:ietf:params:xml:ns:cccp"
  mscp="http://schemas.microsoft.com/rtc/2005/08/cccpextensions"
  msci="http://schemas.microsoft.com/rtc/2005/08/confinfoextensions"
  ci="urn:ietf:params:xml:ns:conference-info"
  requestId="29"
  C3PVersion="1"
  from="sip:organizer@sipdom.com;gruu;opaque=app:conf:focus:id:N9SPWGZR"
  to="sip:thomas.poett@participant.com"
  responder="sip:organizer@sipdom.com;gruu;opaque=app:conf:data-conf:id:N9SPWGZR"
  code="success">
- <addUser>
  <conferenceKeys confEntity="sip:organizer@sipdom.com;gruu;opaque=app:conf:focus:id:N9SPWGZR"/>
+ <user xmlns="urn:ietf:params:xml:ns:conference-info"
  entity="sip:thomas.poett@participant.com"
  state="full">
+ <info xmlns="http://schemas.microsoft.com/rtc/2005/08/cccpextensions">
- <connection-info xmlns="http://schemas.microsoft.com/rtc/2005/08/cccpextensions">
  + <entry>
  - <entry>
    <key>proxy[0].FQDN</key>
    <value>webconf-de.sipdom.com</value>
  - </entry>
```

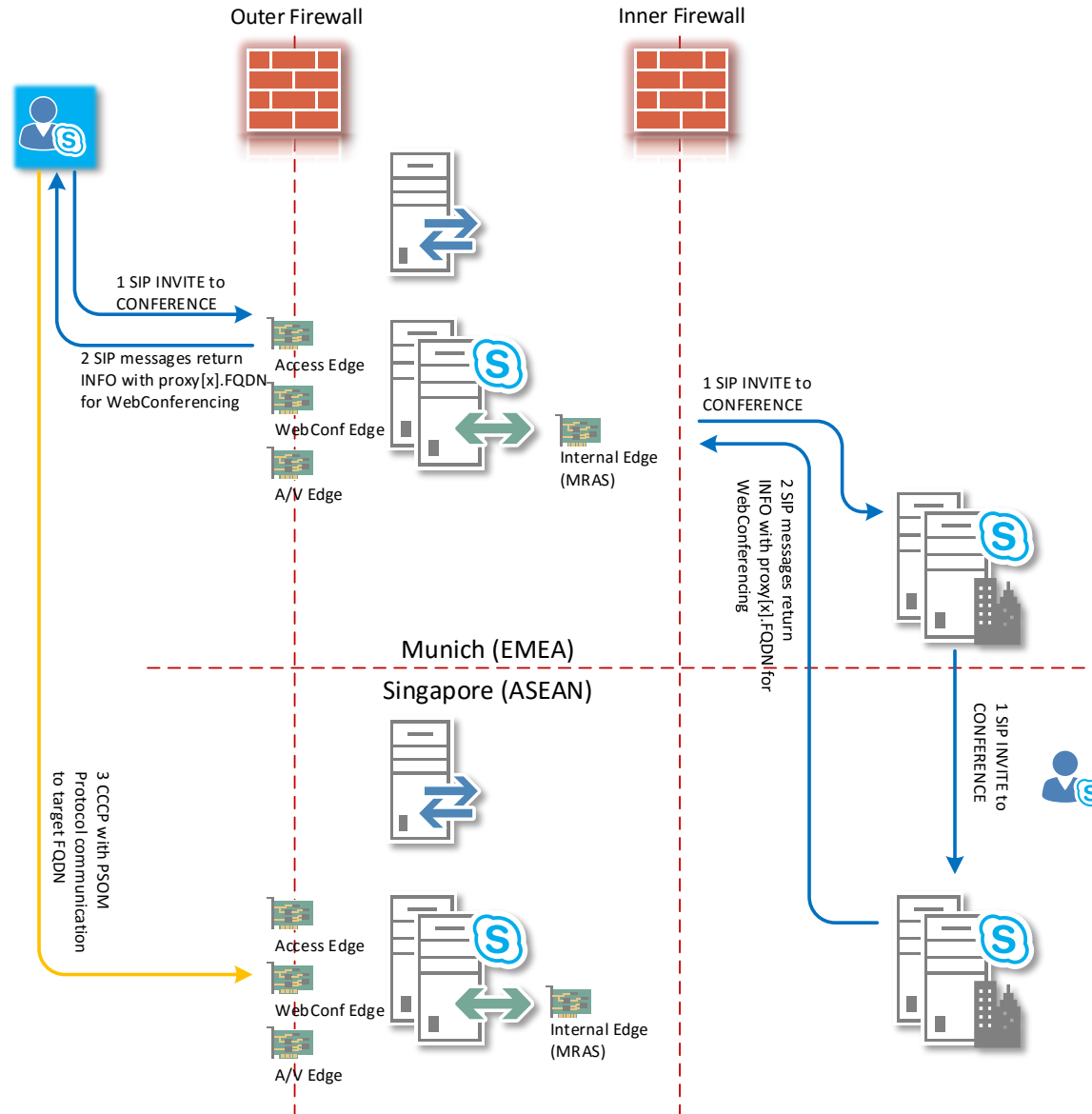
Web Conferencing Flow

CCCP is Microsoft proprietary protocol supporting all relevant features in Web Conferencing, which are:

- **White Board**
- **Polls**
- **Q & A**

Note:

Desktop Sharing is not part of CCCP



Principals on STUN and TURN

- [Session Traversal Utilities for NAT](#) (STUN) – This protocol basically allows an ICE client which is located behind a firewall providing Network Address Translation to discover the public IP address as well as identify the type of NAT in use and then provide that IP to the other party as a potential candidate to send media to. This IP would be assigned to the Internet-facing side of the NAT device which the client is located behind.
- [Traversal Using Relays around NAT](#) (TURN) – This protocol allows a dedicated **ICE** server to provide its own public IP address as a media candidate to one or both parties in a call and will act as a relay or proxy for the media session. This IP would always be the Internet-facing public IP address (either assigned directly to the server interface or assigned to an external NAT-device).

Principals on STUN and TURN

- **Host or Local Candidate** – Local client IP is used for direct-2-direct communication.
- **Reflexive or STUN Candidate** – The public IP address assigned to the client's local firewall perform network address translation.
- **Relay or TURN Candidate** – The publically accessible IP address assigned to the media relay server which is allocated to the client. In Skype Server this is the public IP address assigned either directly to the external A/V Edge interface or the public IP address allocated to a NAT device (e.g. firewall)

Note:

TURN makes it explainable why the Public IP address assigned to Edge AV must be provided in Topology **(ICE)**

Candidate Exchange (SDP) – remote client

Local host UDP IPv4 address:

```
a=candidate:1 1 UDP 2130706431 192.168.0.16 10668 typ host  
a=candidate:1 2 UDP 2130705918 192.168.0.16 10669 typ host
```

Local host UDP IPv6 address:

```
a=x-candidate-ipv6:2 1 UDP 2130705919 fd00:26:5bcf:fb92:d812:2961:203d:afd3 15206 typ host  
a=x-candidate-ipv6:2 2 UDP 2130705406 fd00:26:5bcf:fb92:d812:2961:203d:afd3 15207 typ host  
a=x-candidate-ipv6:3 1 UDP 33553407 2001:0:5ef5:79fd:34ae:19fd:4de5:8658 23084 typ host  
a=x-candidate-ipv6:3 2 UDP 33552894 2001:0:5ef5:79fd:34ae:19fd:4de5:8658 23085 typ host
```

Local host TCP-PASS IPv4 address:

```
Edge AV ext IP=195.145.140.92 - local NAT device ext IP=178.26.121.167  
a=candidate:4 1 TCP-PASS 174455295 195.145.140.92 54427 typ relay raddr 178.26.121.167 rport 11603  
a=candidate:4 2 TCP-PASS 174454782 195.145.140.92 54427 typ relay raddr 178.26.121.167 rport 11603
```

Local host UDP IPv4 address (relay raddr):

```
Edge AV ext IP=195.145.140.92 - local NAT device ext IP=178.26.121.167  
a=candidate:5 1 UDP 184547327 195.145.140.92 57962 typ relay raddr 178.26.121.167 rport 6098  
a=candidate:5 2 UDP 184546814 195.145.140.92 51825 typ relay raddr 178.26.121.167 rport 6099
```

Local host UDP IPv4 address (srflx raddr):

```
NAT device ext IP=178.26.121.167 - local client IP=192.168.0.16  
a=candidate:6 1 UDP 1694234111 178.26.121.167 6098 typ srflx raddr 192.168.0.16 rport 6098  
a=candidate:6 2 UDP 1694233598 178.26.121.167 6099 typ srflx raddr 192.168.0.16 rport 6099
```

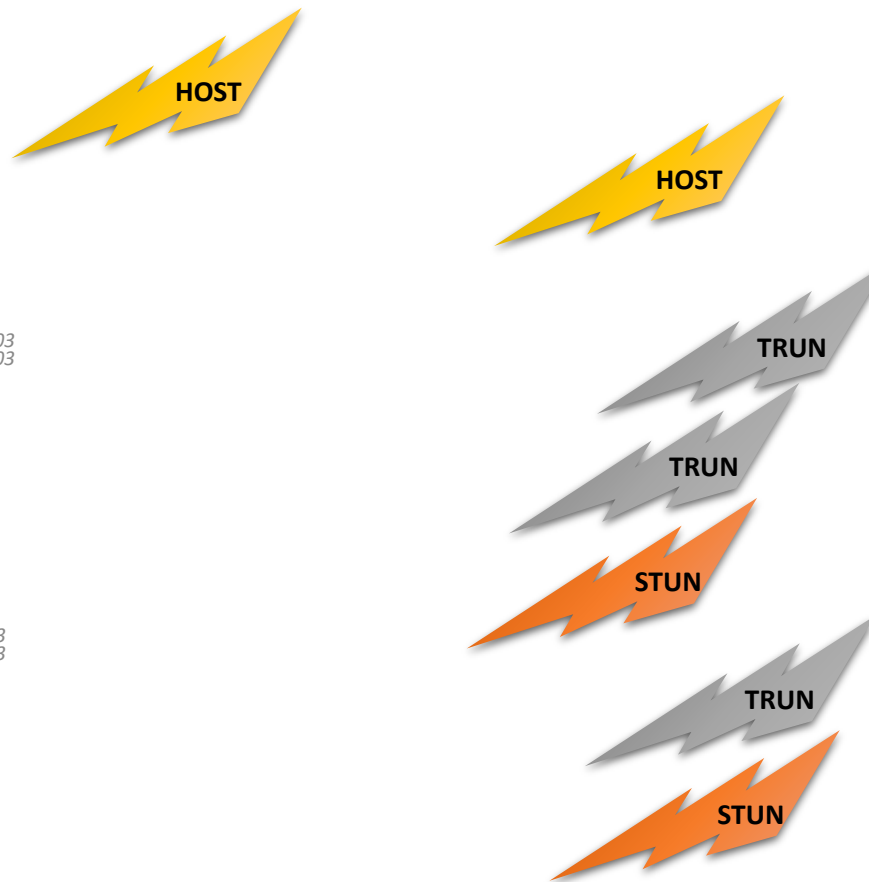
Local host TCP-ACT IPv4 address (relay raddr):

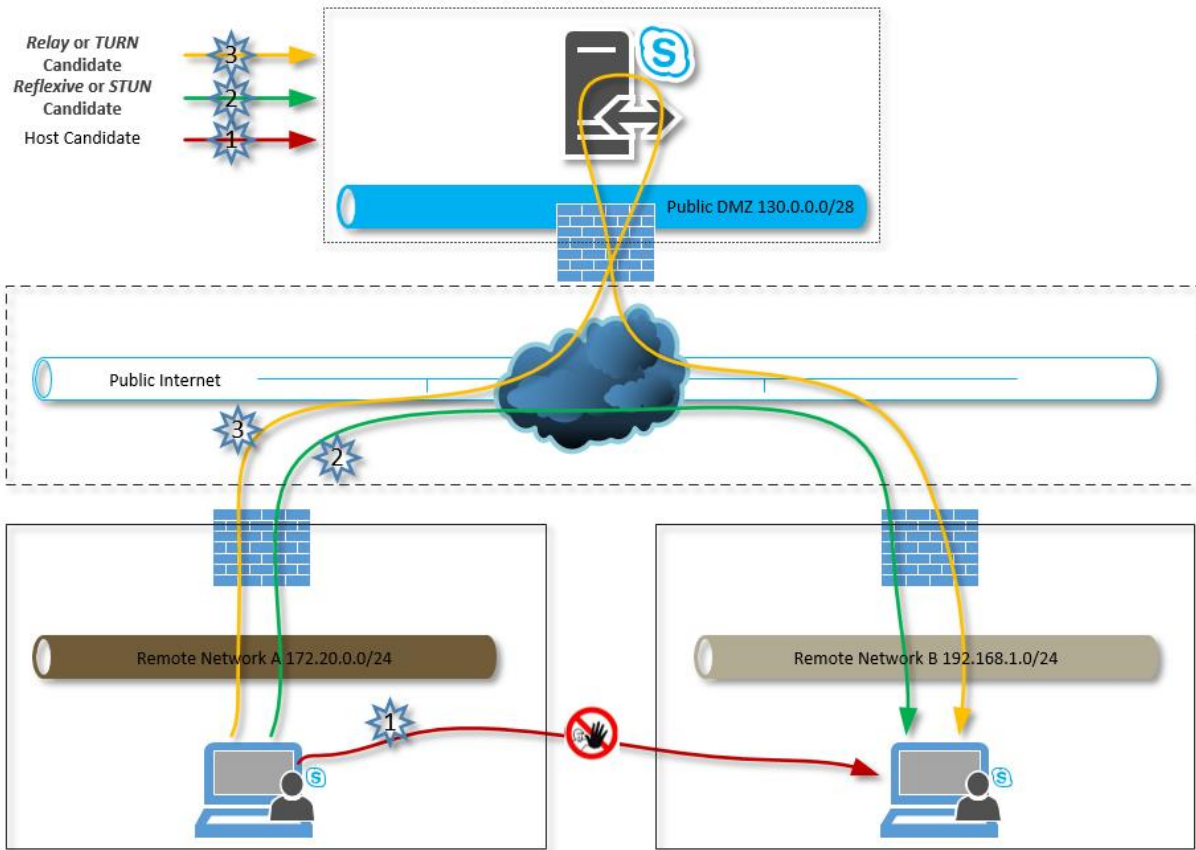
```
Edge AV ext IP=195.145.140.92 - local NAT device ext IP=178.26.121.167  
a=candidate:7 1 TCP-ACT 174846975 195.145.140.92 54427 typ relay raddr 178.26.121.167 rport 11603  
a=candidate:7 2 TCP-ACT 174846462 195.145.140.92 54427 typ relay raddr 178.26.121.167 rport 11603
```

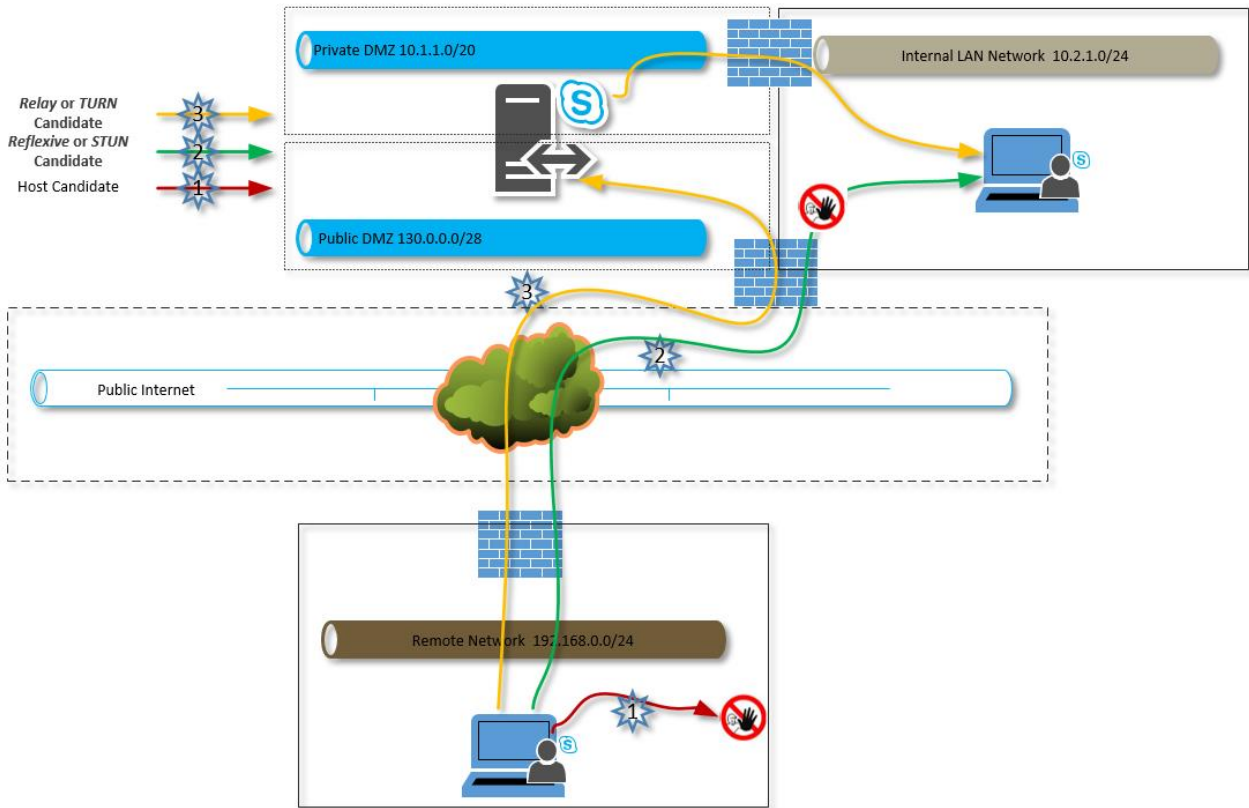
Local host TCP-ACT IPv4 address (srflx raddr):

```
NAT device ext IP=178.26.121.167 - local client IP=192.168.0.16  
a=candidate:8 1 TCP-ACT 1684795903 178.26.121.167 11603 typ srflx raddr 192.168.0.16 rport 11603
```

```
a=candidate:8 2 TCP-ACT 1684795390 178.26.121.167 11603 typ srflx raddr 192.168.0.16 rport 11603
```



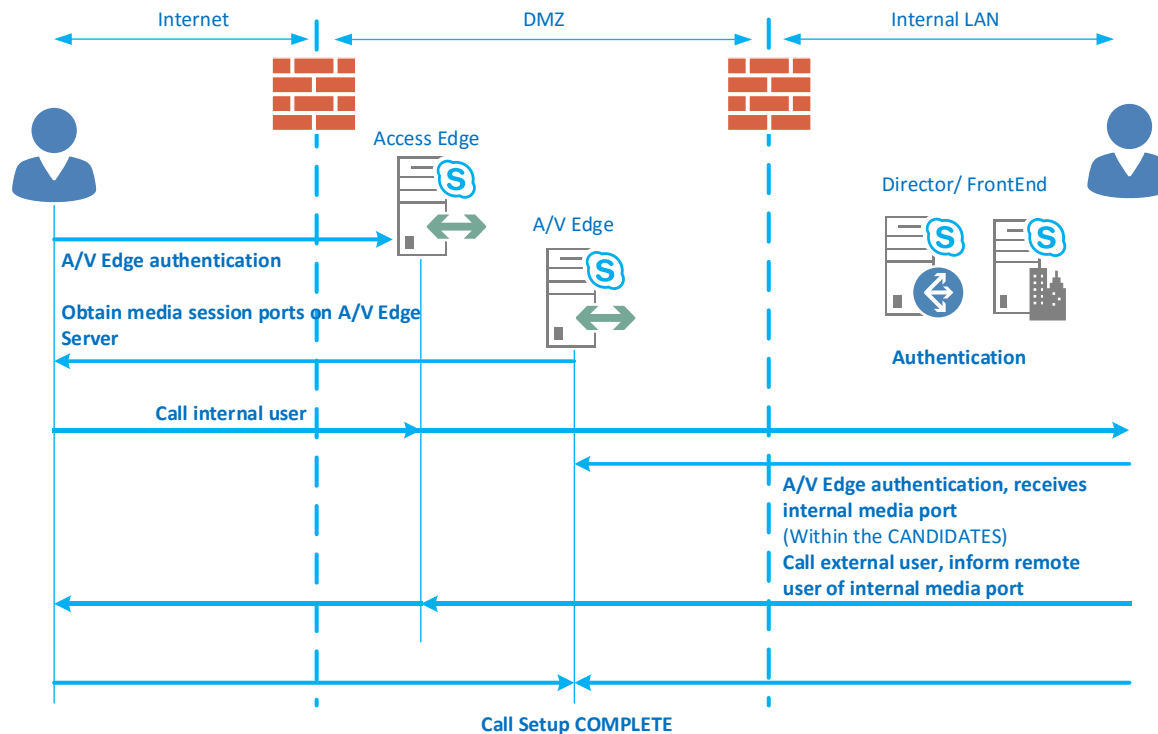




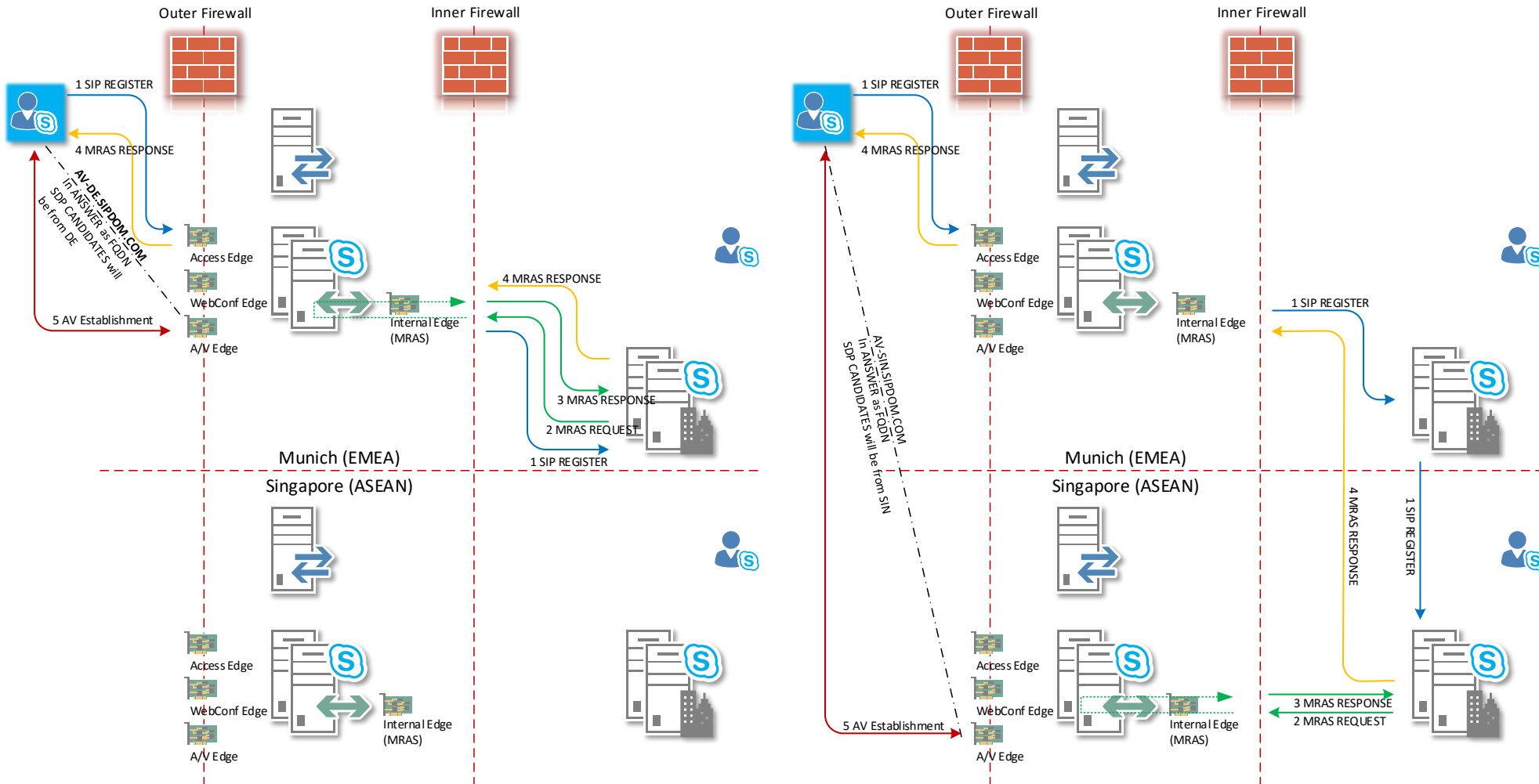
A/V Edge Flow

SDP is the “Self Description Protocol” defined in RFC 4566 and responsible for testing and addressing the possible IP path (IP Address and Ports) for Audio/ Video communication flow.

As we can identify, the MRAS is taking place first based the associated Frontend/ Edge Pool for the user (either internal or remote). We have the CANDIDATE exchange in the 183 SESSION PROGRESS message.

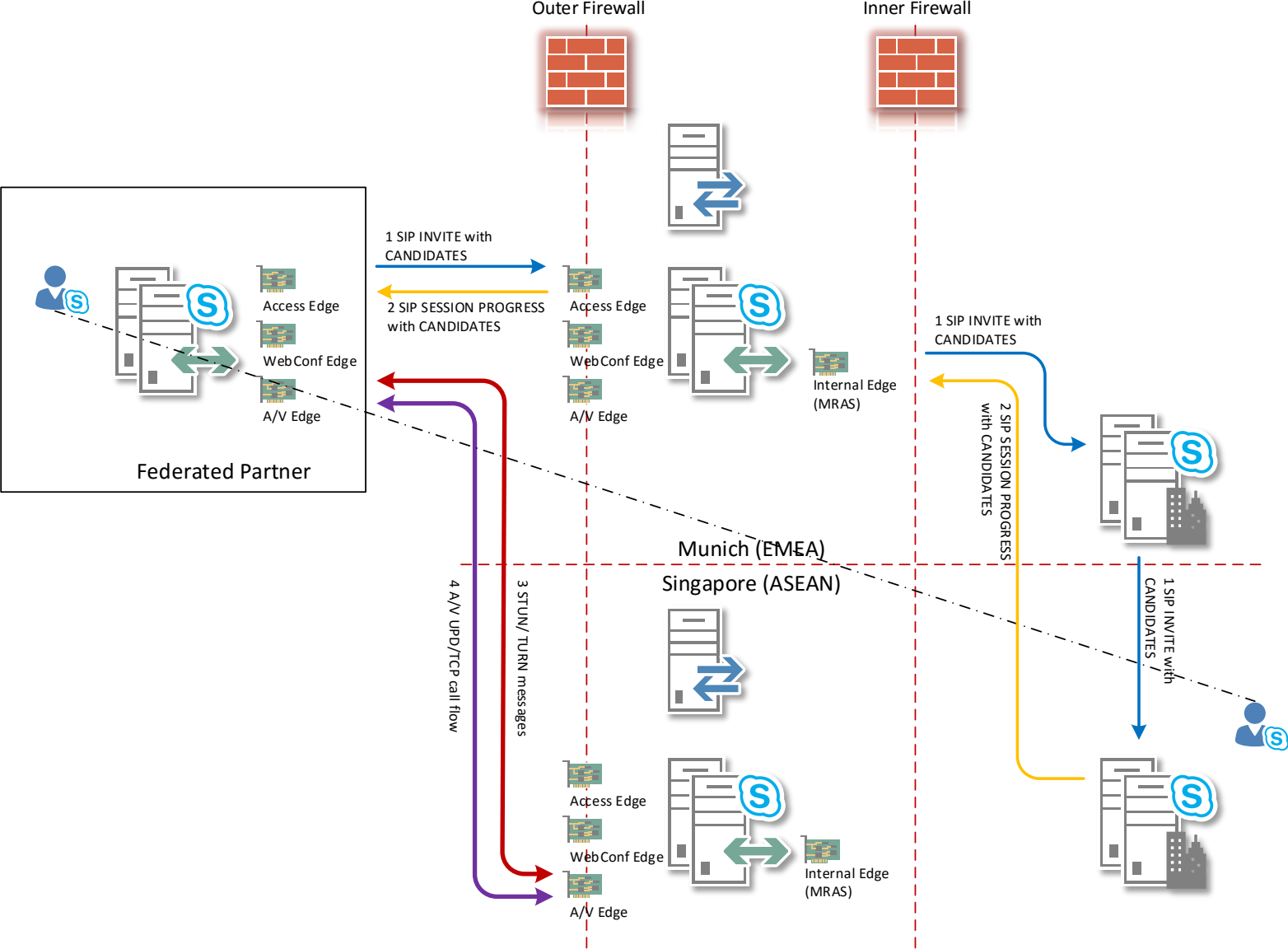


A/V Edge Flow



NOTE: Keep in mind, for AV external IP address → CMS (Topology information) are used

A/V Edge Flow



Geo Edge Deployments Advice

The external DNS is globally valid and shall be understood as a single configuration, but tight with associated geographical sites.

Example for one Skype for Business site:

FQDN	IP	Comment
SIP.SIPDOM.COM	CNAME to SIP-DE.SIPDOM.COM	EDGE
SIP-DE.SIPDOM.COM	1.2.3.4	EDGE
WC-DE.SIPDOM.COM	1.2.3.5	EDGE
AV-DE.SIPDOM.COM	1.2.3.6	EDGE
WEB-EXT-DE01.SIPDOM.COM	1.2.3.8	RevProxy multi local pool
WEB-EXT-DE02.SIPDOM.COM	1.2.3.10	RevProxy multi local pool
LYNCDISCOVER.SIPDOM.COM	1.2.3.8	RevProxy CENTRAL DISCOVERY URL
MEET-DE.SIPDOM.COM	1.2.3.8	RevProxy
DIALIN.SIPDOM.COM	1.2.3.8	RevProxy CENTRAL DIALIN WebPage
SCHEDULER.SIPDOM.COM	1.2.3.8	RevProxy Schedule Web Access for Meeting planning
_SIP._TLS.SIPDOM.COM 0 100 443 SIP.SIPDOM.COM	SIP-DE.SIPDOM.COM	MSI/C2R Sfb Client Login
_SIPEXTERNAL._TLS.SIPDOM.COM 0 100 5061 SIP.SIPDOM.COM	SIP-DE.SIPDOM.COM	
_SIPFEDERATIONTLS._TCP.SIPDOME.COM 0 100 5061 SIP.SIPDOM.COM	SIP-DE.SIPDOM.COM	

Note:

AV Edge could never be GeoDNS Load Balanced, due to AV communication must be able directly addressing the AV IP address.

This is associated with Edge <-> FE Pool

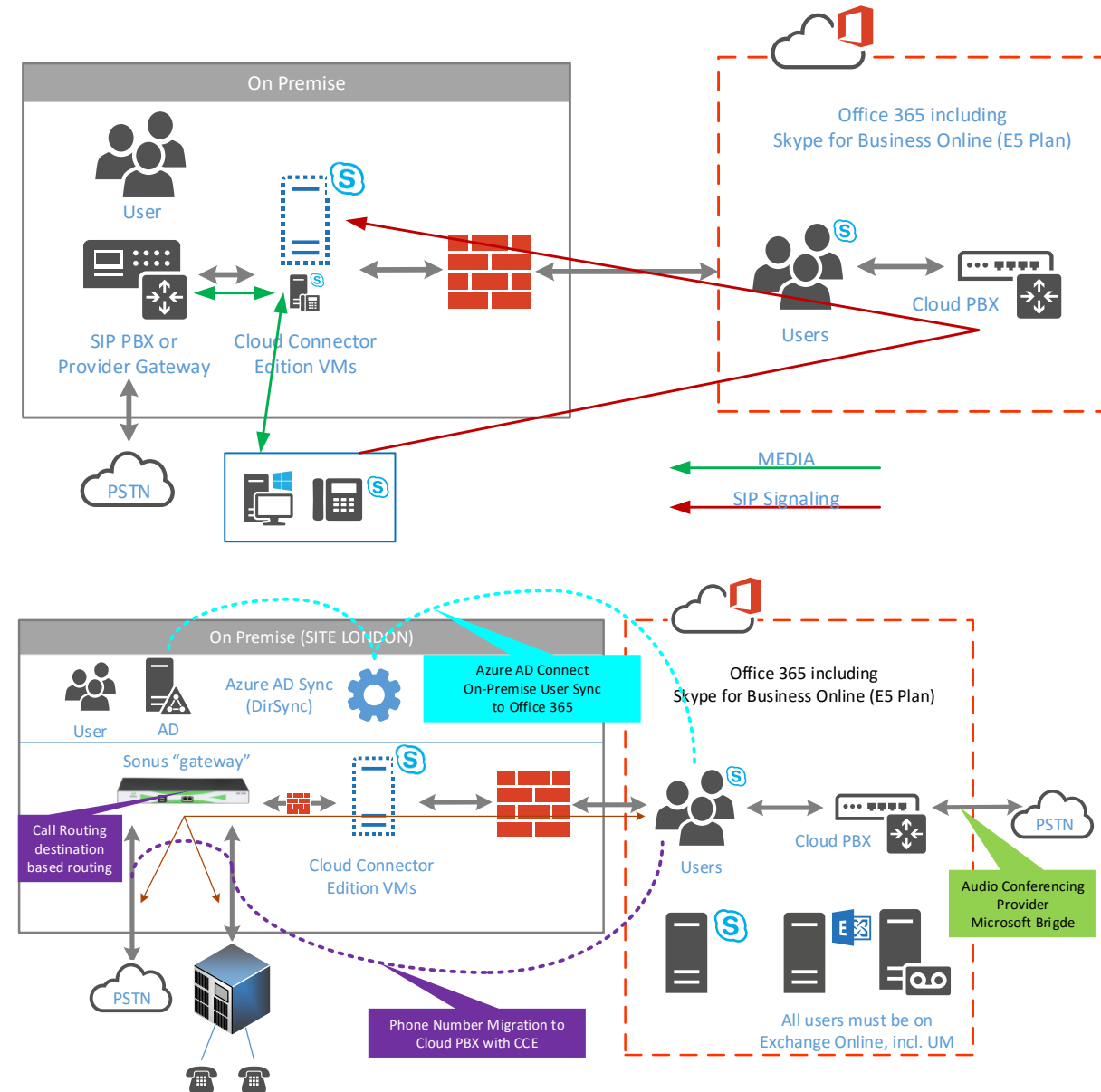
Principals CCE Deployments

*) CCE – Cloud Connector Edition

External DNS entries
(also used for certificates):

- **Access Edge:**
e.g. ACCESS.SIPDOMAIN.COM
- **Media Relay:**
e.g. MEDIA.SIPDOMAIN.COM
(not necessary in certificates)
- **Data Proxy:**
e.g. DP.SIPDOMAIN.COM We can identify the identical principals for global CCE deployments, using e.g. ACCESS-LOC01, ACCESS-LOCxx

SIP.tenant.com points to Office 365



Upcoming Guide soon

Having headache ???



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Thank you